

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:

Shin KUWABARA

Serial Number: Not Yet Assigned

Filed: December 20, 2001

For: NEAR INFRARED ABSORPTION MATERIAL

PRELIMINARY AMENDMENT

Assistant Commissioner

For Patents

Washington, D.C. 20231

December 27, 2001

Sir:

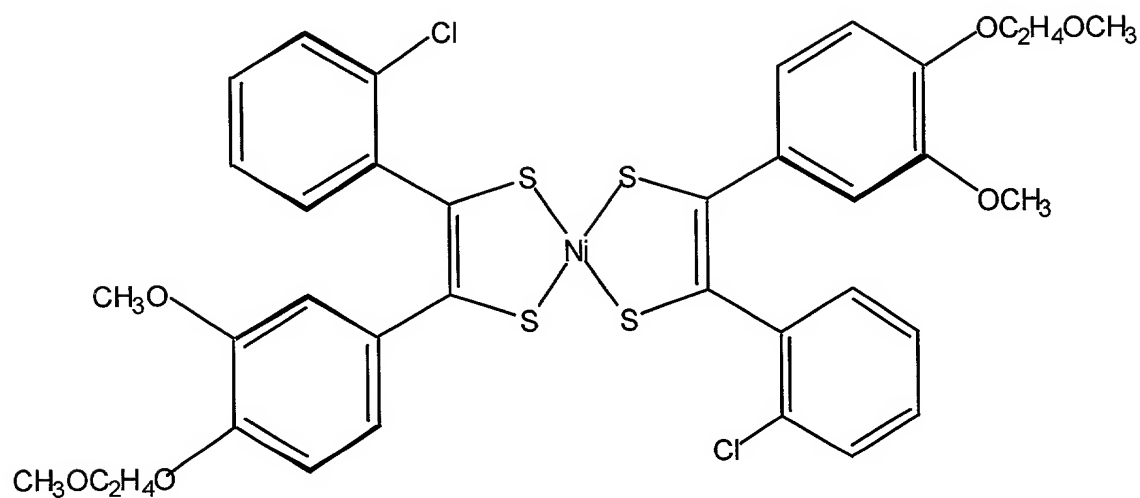
Prior to calculation of the fee and examination on the merits of the above-identified patent application, please amend the application as follows:

IN THE CLAIMS:

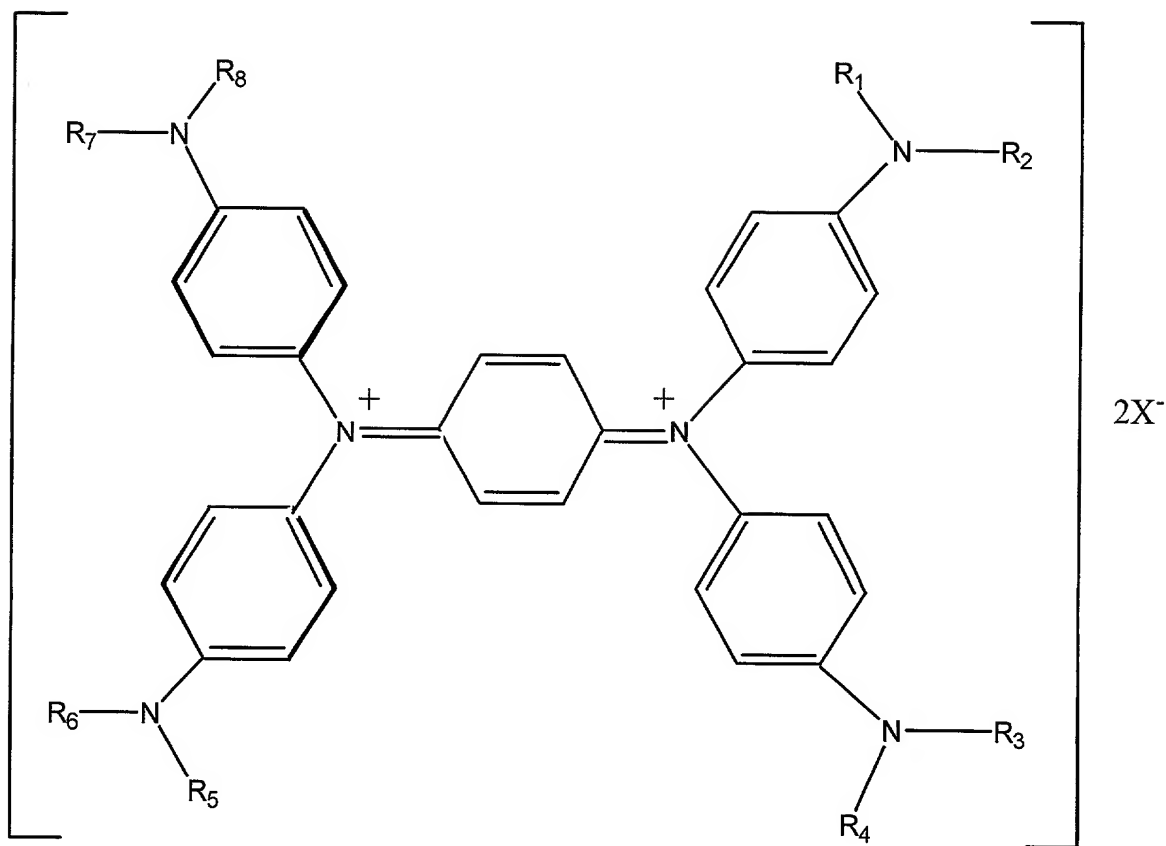
Please amend claim 3 to read as follows:

3. (Amended) A near infrared absorption material according to Claim 1, wherein the near infrared absorption dye is a dithiol-

nickel complex represented by the following formula (1):



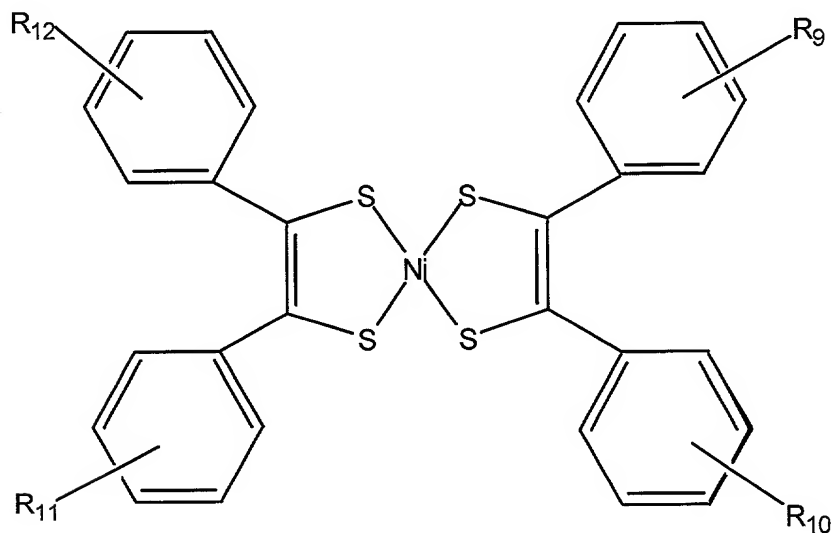
and at least one kind of diimonium compound represented by the following general formula (2):



(wherein R_1 to R_8 may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group or a C_{6-12} aryl group; and X is an anion typified by SbF_6^- , ClO_4^- , NO_3^- or a halogen ion).

Please amend claim 4 to read as follows:

4. (Amended) A near infrared absorption material according to Claim 1, which further contains at least one kind of dithiol-nickel complex represented by the following general formula (3):

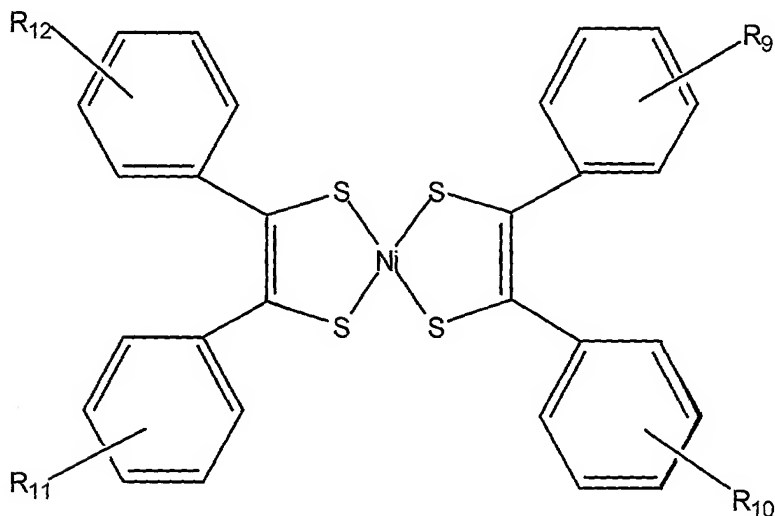


(wherein R₉ to R₁₂ may be the same or different and are each a hydrogen atom, a C₁₋₄ alkylene group, an aryl group, an aralkyl group, an alkylamino group, an alkoxy group or a halogen atom).

Please amend claim 5 to read as follows:

5. (Amended) A near infrared absorption material according

4. (Amended) A near infrared absorption material according to Claim 1, which further contains at least one kind of dithiol-nickel complex represented by the following general formula (3):

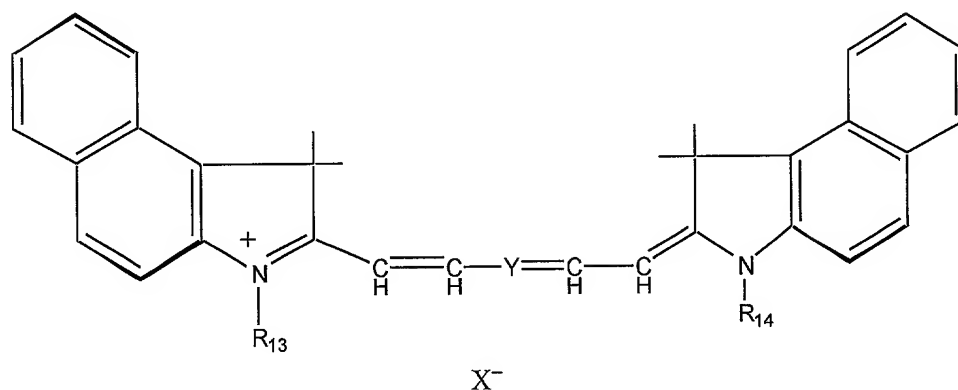


(wherein R₉ to R₁₂ may be the same or different and are each a hydrogen atom, a C₁₋₄ alkylene group, an aryl group, an aralkyl group, an alkylamino group, an alkoxy group or a halogen atom).

Please amend claim 5 to read as follows:

5. (Amended) A near infrared absorption material according

to Claim 1, which further contains at least one kind of polymethine dye represented by the following general formula (4):

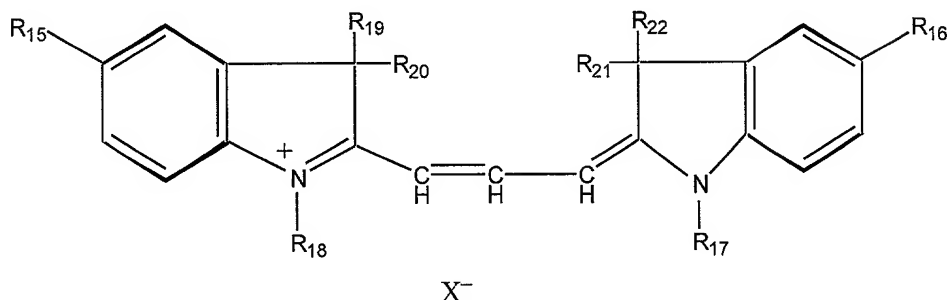


(wherein R_{13} and R_{14} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; Y is a sulfur atom, a methine group or a chlorocyclohexene group; and X is an anion typified by SbF_6^{-} , ClO_4^{-} , NO_3^{-} or a halogen ion).

Please amend claim 7 to read as follows:

7. **(Amended)** A near infrared absorption material according to Claim 1, wherein the dye selectively absorbing a light of 550 to

620 nm wavelength region is at least one kind of cyanin dye represented by the following general formula (6):



(wherein R_{15} , R_{16} , R_{19} , R_{20} , R_{21} and R_{22} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl or alkoxy group, an amino group, a cyano group, a nitro group or a carboxyl group; R_{17} and R_{18} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; and X is an anion typified by SbF_6^{-} , ClO_4^{-} , NO_3^{-} or a halogen ion).

Please amend claim 9 to read as follows:

9. (Amended) A near infrared absorption material according

to Claim 1, wherein the transparent substrate is made from a polycarbonate, a polyarylate or both of them.

Please amend claim 10 to read as follows:

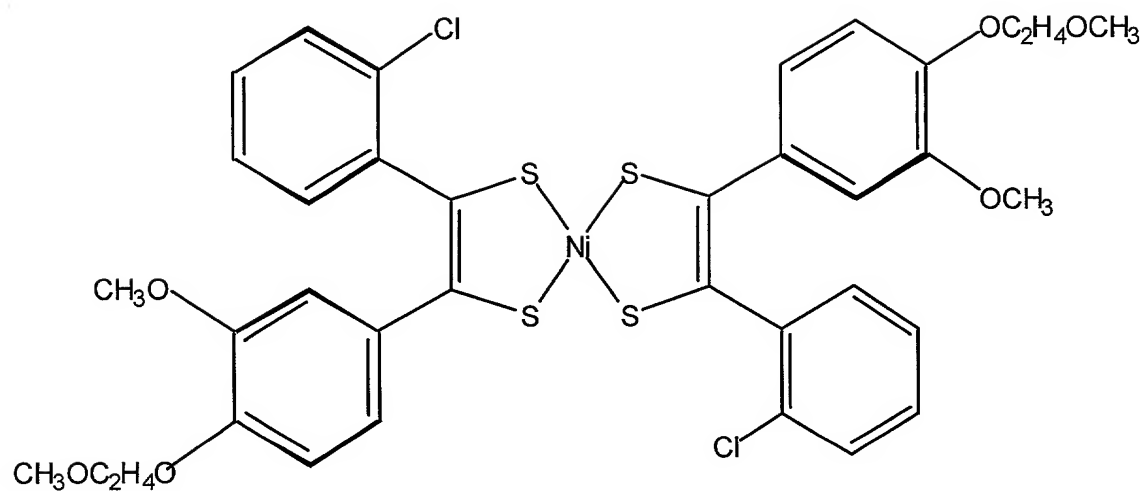
10. **(Amended)** A near infrared absorption material according to Claim 1, wherein the transparent substrate is made from at least one kind selected from a polyethylene terephthalate, a polyethylene naphthalate and a polycycloolefin.

Please amend claim 11 to read as follows:

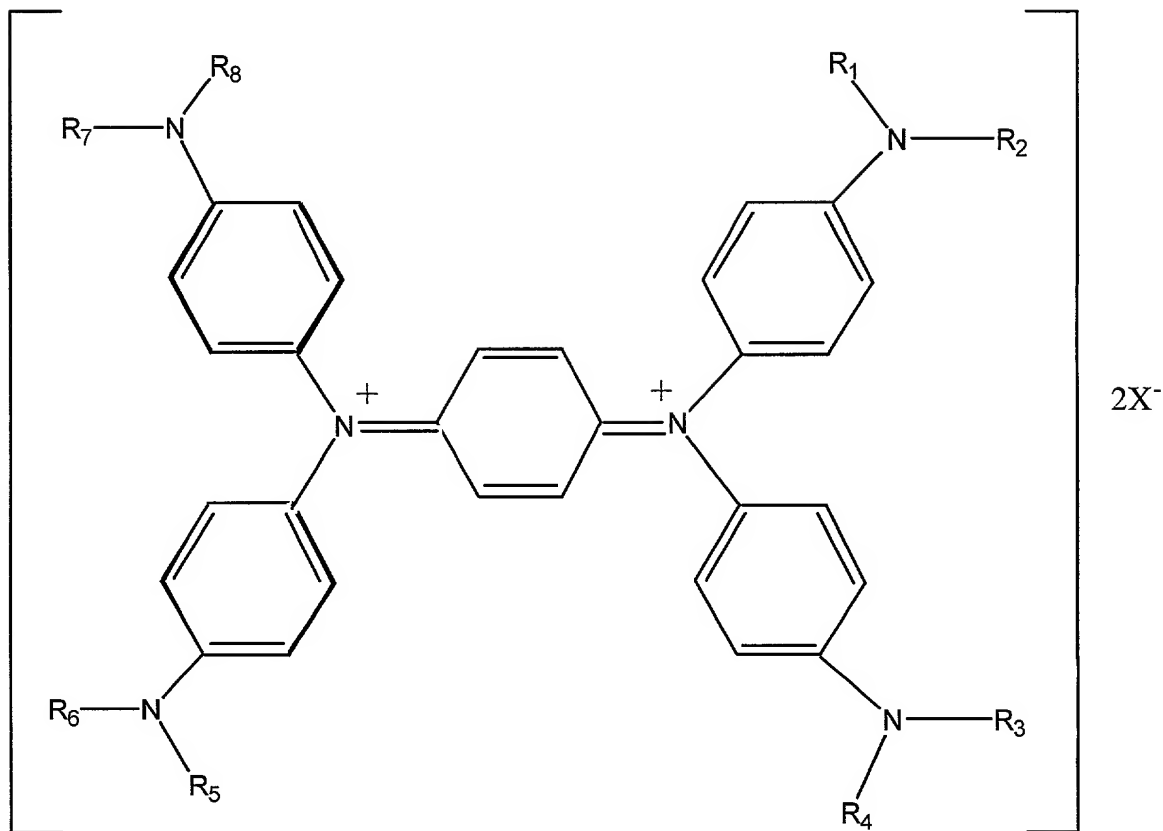
11. **(Amended)** A filter for plasma display panel, made from a near infrared absorption material set forth in Claim 1.

Please add new claims 12 to 27 as follows:

12. **(New)** A near infrared absorption material according to Claim 2, wherein the near infrared absorption dye is a dithiol-nickel complex represented by the following formula (1):



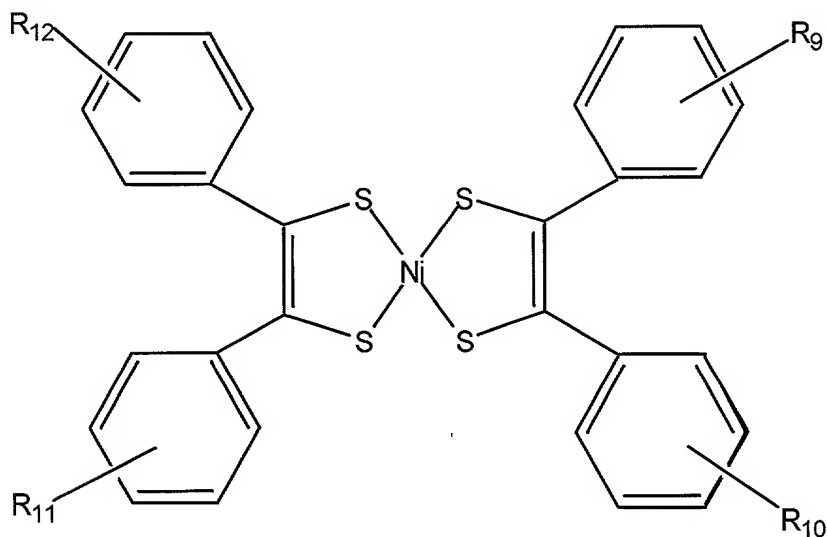
and at least one kind of diimonium compound represented by the following general formula (2):



(wherein R_1 to R_8 may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group or a C_{6-12} aryl group; and X is an anion typified by SbF_6^- , ClO_4^- , NO_3^- or a halogen ion).

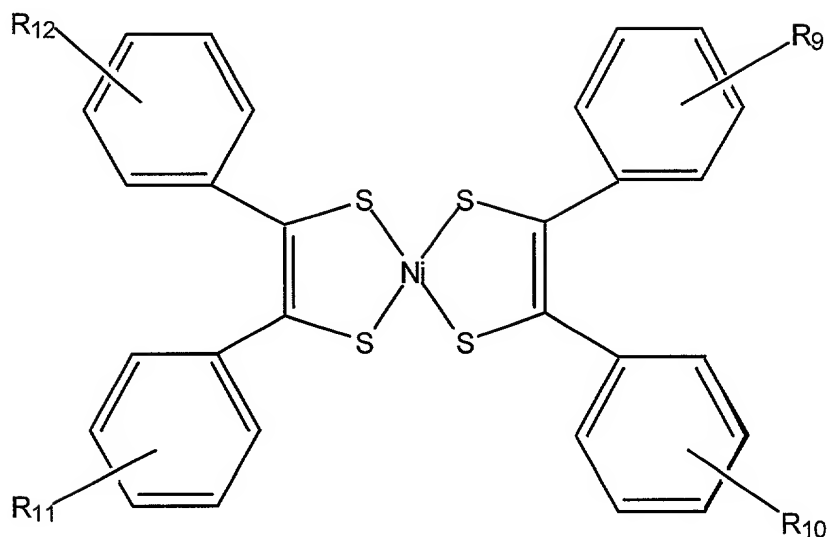
13. (New) A near infrared absorption material according to Claim 2, which further contains at least one kind of dithiol-

nickel complex represented by the following general formula (3):



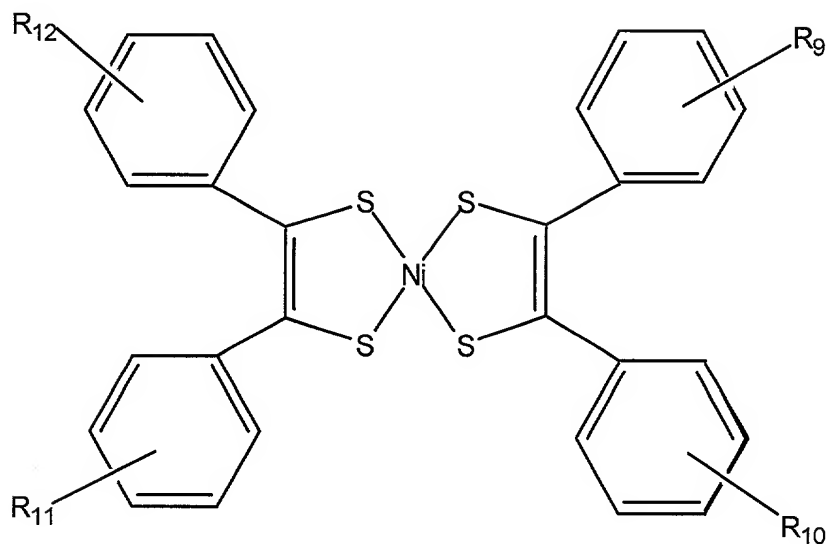
(wherein R₉ to R₁₂ may be the same or different and are each a hydrogen atom, a C₁₋₄ alkylene group, an aryl group, an aralkyl group, an alkylamino group, an alkoxy group or a halogen atom).

14. **(New)** A near infrared absorption material according to Claim 3, which further contains at least one kind of dithiol-nickel complex represented by the following general formula (3):



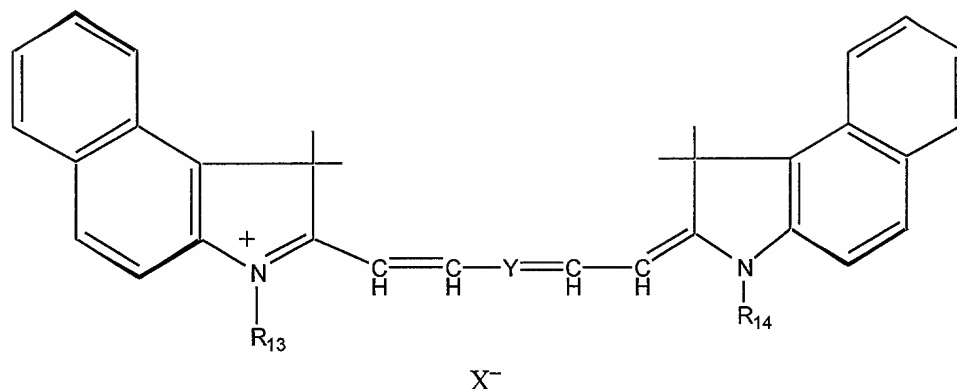
(wherein R₉ to R₁₂ may be the same or different and are each a hydrogen atom, a C₁₋₄ alkylene group, an aryl group, an aralkyl group, an alkylamino group, an alkoxy group or a halogen atom).

15. **(New)** A near infrared absorption material according to Claim 12, which further contains at least one kind of dithiol-nickel complex represented by the following general formula (3):



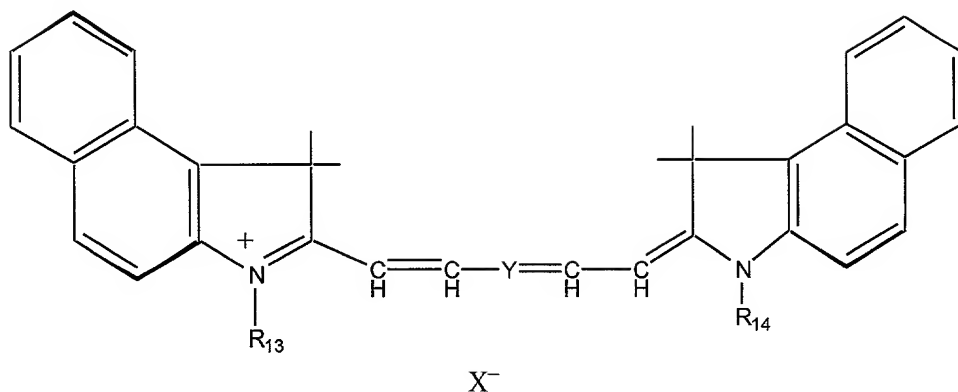
(wherein R₉ to R₁₂ may be the same or different and are each a hydrogen atom, a C₁₋₄ alkylene group, an aryl group, an aralkyl group, an alkylamino group, an alkoxy group or a halogen atom).

16. **(New)** A near infrared absorption material according to Claim 2, which further contains at least one kind of polymethine dye represented by the following general formula (4):



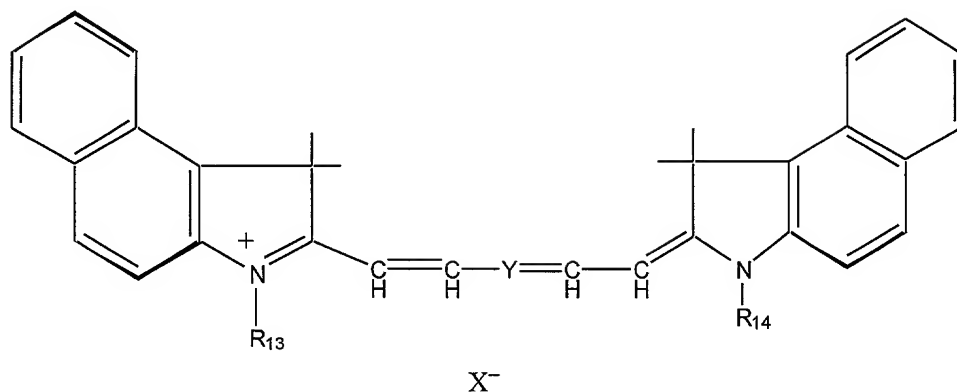
(wherein R_{13} and R_{14} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; Y is a sulfur atom, a methine group or a chlorocyclohexene group; and X is an anion typified by SbF_6^- , ClO_4^- , NO_3^- or a halogen ion).

17. (New) A near infrared absorption material according to Claim 3, which further contains at least one kind of polymethine dye represented by the following general formula (4):



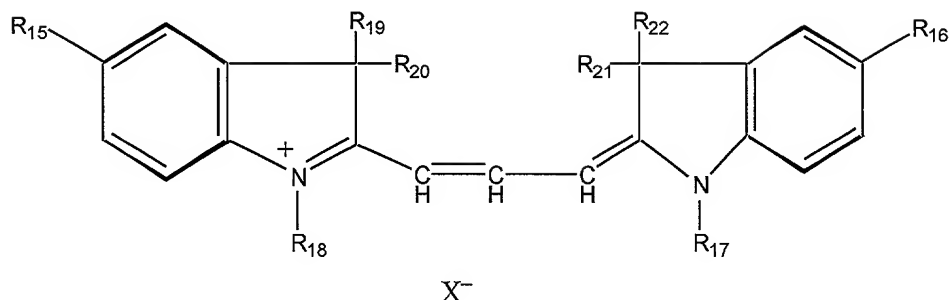
(wherein R_{13} and R_{14} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; Y is a sulfur atom, a methine group or a chlorocyclohexene group; and X is an anion typified by SbF_6^{-} , ClO_4^{-} , NO_3^{-} or a halogen ion).

18. (New) A near infrared absorption material according to Claim 12, which further contains at least one kind of polymethine dye represented by the following general formula (4):



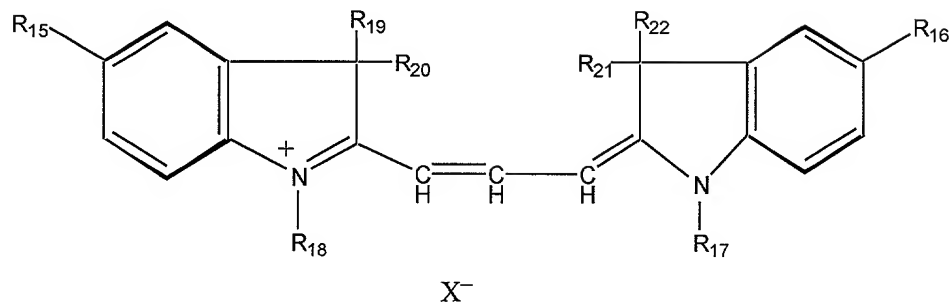
(wherein R_{13} and R_{14} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; Y is a sulfur atom, a methine group or a chlorocyclohexene group; and X is an anion typified by SbF_6^{-} , ClO_4^{-} , NO_3^{-} or a halogen ion).

19. (New) A near infrared absorption material according to Claim 2, wherein the dye selectively absorbing a light of 550 to 620 nm wavelength region is at least one kind of cyanin dye represented by the following general formula (6):



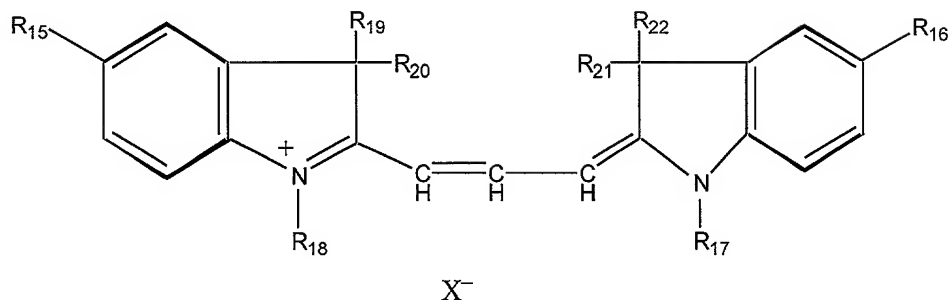
(wherein R_{15} , R_{16} , R_{19} , R_{20} , R_{21} and R_{22} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl or alkoxy group, an amino group, a cyano group, a nitro group or a carboxyl group; R_{17} and R_{18} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; and X is an anion typified by SbF_6^- , ClO_4^- , NO_3^- or a halogen ion).

20. (New) A near infrared absorption material according to Claim 3, wherein the dye selectively absorbing a light of 550 to 620 nm wavelength region is at least one kind of cyanin dye represented by the following general formula (6):



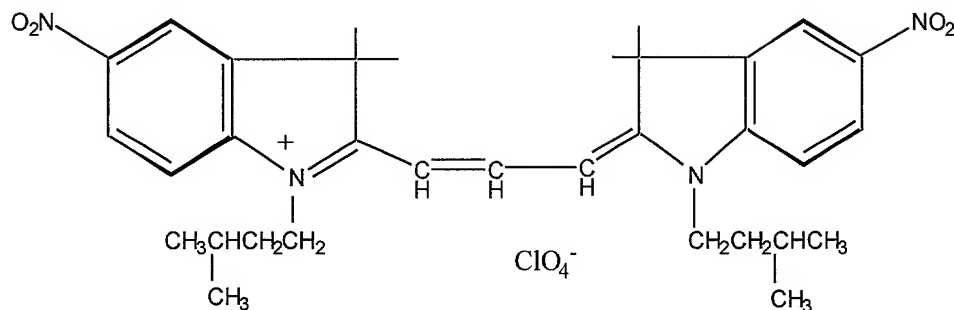
(wherein R_{15} , R_{16} , R_{19} , R_{20} , R_{21} and R_{22} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl or alkoxy group, an amino group, a cyano group, a nitro group or a carboxyl group; R_{17} and R_{18} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; and X is an anion typified by SbF_6^- , ClO_4^- , NO_3^- or a halogen ion).

21. (New) A near infrared absorption material according to Claim 12, wherein the dye selectively absorbing a light of 550 to 620 nm wavelength region is at least one kind of cyanin dye represented by the following general formula (6):

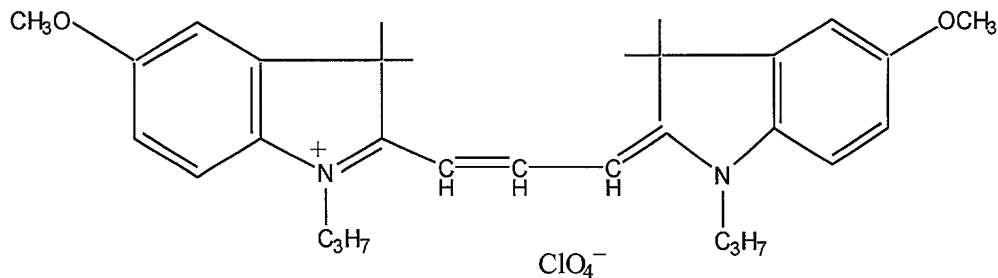


(wherein R_{15} , R_{16} , R_{19} , R_{20} , R_{21} and R_{22} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl or alkoxy group, an amino group, a cyano group, a nitro group or a carboxyl group; R_{17} and R_{18} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; and X is an anion typified by SbF_6^{-} , ClO_4^{-} , NO_3^{-} or a halogen ion).

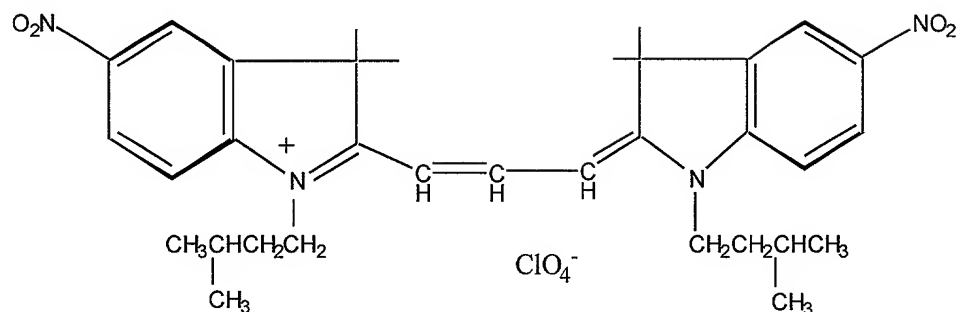
22. (New) A near infrared absorption material according to Claim 19, wherein the dye selectively absorbing a light of 550 to 620 nm wavelength region is at least one dye selected from the dyes represented by the following general formula (7):



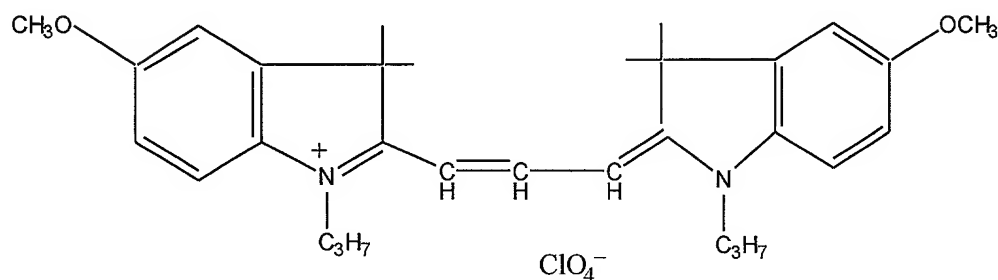
and the dyes represented by the following general formula (8):



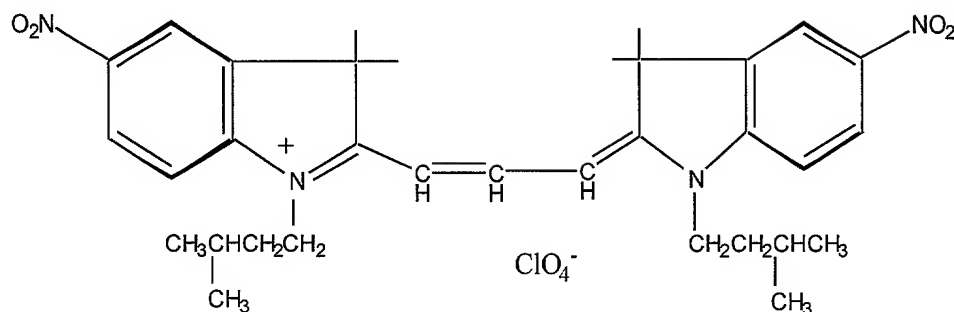
23. **(New)** A near infrared absorption material according to Claim 20, wherein the dye selectively absorbing a light of 550 to 620 nm wavelength region is at least one dye selected from the dyes represented by the following general formula (7):



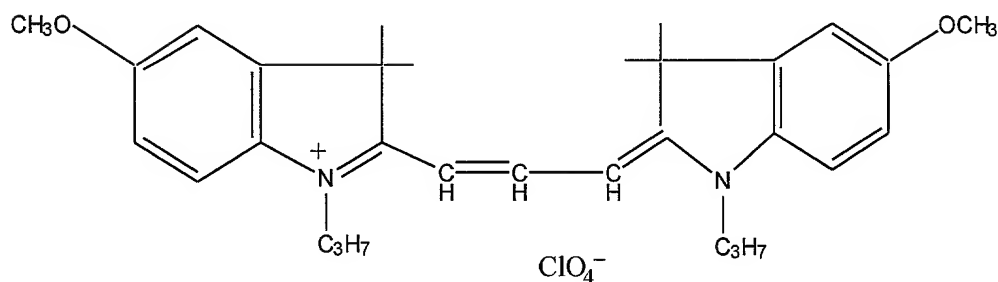
and the dyes represented by the following general formula (8):



24. (New) A near infrared absorption material according to Claim 21, wherein the dye selectively absorbing a light of 550 to 620 nm wavelength region is at least one dye selected from the dyes represented by the following general formula (7):



and the dyes represented by the following general formula (8):



25. **(New)** A near infrared absorption material according to Claim 2, wherein the transparent substrate is made from a polycarbonate, a polyarylate or both of them.

26. **(New)** A near infrared absorption material according to Claim 2, wherein the transparent substrate is made from at least one kind selected from a polyethylene terephthalate, a polyethylene naphthalate and a polycycloolefin.

27/37. (New) A filter for plasma display panel, made from a
near infrared absorption material set forth in Claim 2.

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REMARKS

Claims 3-5, 7 and 9-11 have been amended to remove multiple dependencies. New claims 12 - 27 have been added to cover embodiments deleted by the amendments to the original claims.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attachment is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE."

In the event any additional fees are required, please charge our Deposit Account No. 111833.

Respectfully submitted,

KUBOVCIK & KUBOVCIK



Keiko Tanaka Kubovcik
Reg. No. 40,428

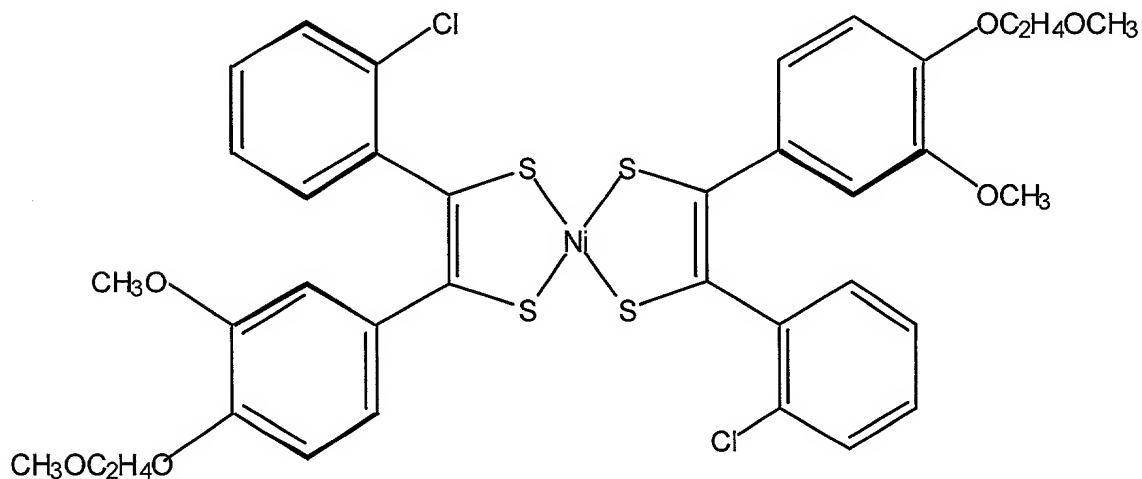
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KTK/emd

VERSION WITH MARKINGS TO SHOW CHANGES MADE

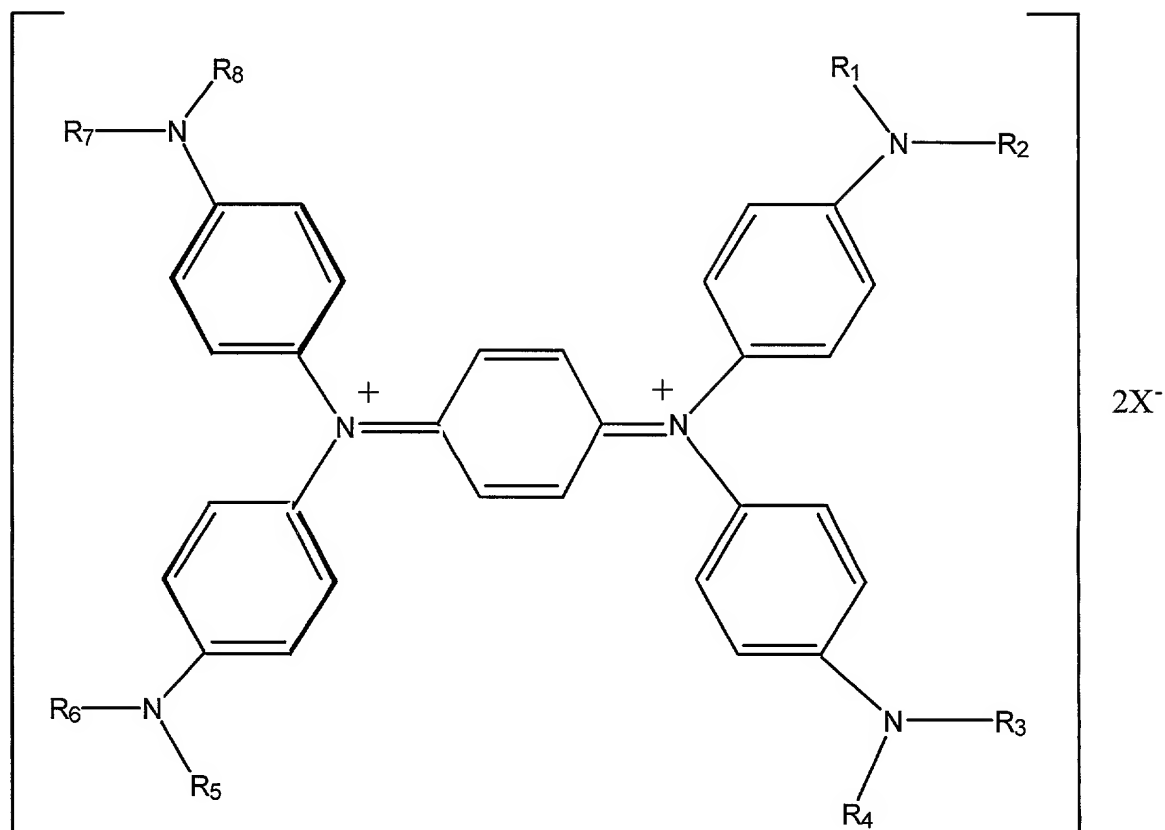
IN THE CLAIMS:

Claims 3 - 5, 7 and 9 - 11 have been amended as follows:

3. (Amended) A near infrared absorption material according to Claim 1 [~~or 2~~], wherein the near infrared absorption dye is a dithiol-nickel complex represented by the following formula (1):

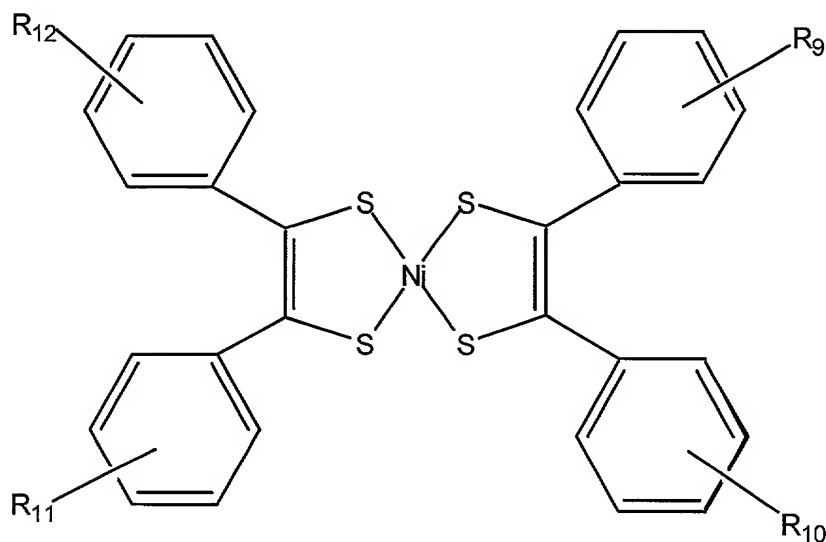


and at least one kind of diimonium compound represented by the following general formula (2):



(wherein R₁ to R₈ may be the same or different and are each a hydrogen atom, a C₁₋₁₂ alkyl group or a C₆₋₁₂ aryl group; and X is an anion typified by SbF₆⁻, ClO₄⁻, NO₃⁻ or a halogen ion).

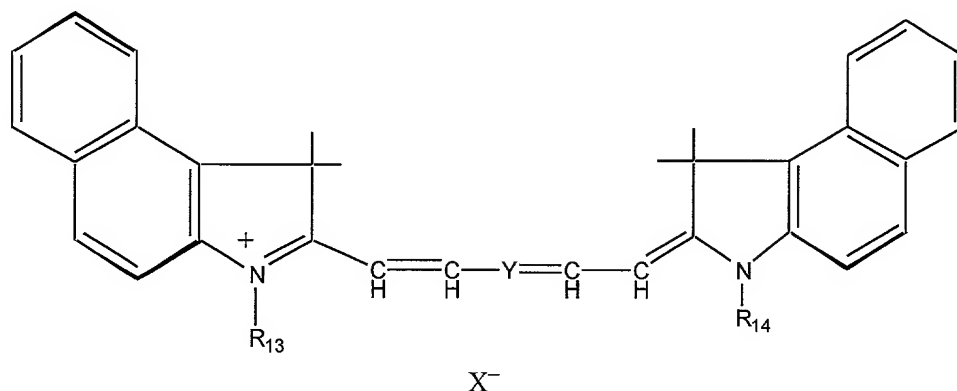
4. (Amended) A near infrared absorption material according to ~~[any of Claims]~~ Claim 1 ~~[to 3]~~, which further contains at least one kind of dithiol-nickel complex represented by the following general formula (3):



(wherein R₉ to R₁₂ may be the same or different and are each a hydrogen atom, a C₁₋₄ alkylene group, an aryl group, an aralkyl group, an alkylamino group, an alkoxy group or a halogen atom).

5. (Amended) A near infrared absorption material according

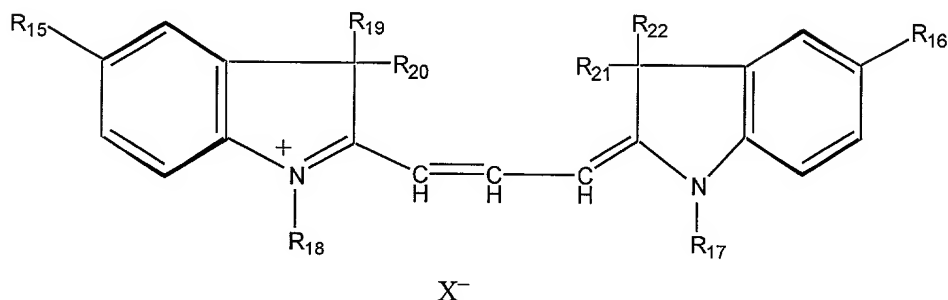
to ~~[any of Claims]~~ **Claim** 1 ~~[to 3]~~, which further contains at least one kind of polymethine dye represented by the following general formula (4):



(wherein R_{13} and R_{14} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; Y is a sulfur atom, a methine group or a chlorocyclohexene group; and X is an anion typified by SbF_6^{-} , ClO_4^{-} , NO_3^{-} or a halogen ion).

7. (Amended) A near infrared absorption material according to ~~[any of Claims]~~ **Claim** 1 ~~[to 3]~~, wherein the dye selectively absorbing a light of 550 to 620 nm wavelength region is at least

one kind of cyanin dye represented by the following general formula
(6):



(wherein R_{15} , R_{16} , R_{19} , R_{20} , R_{21} and R_{22} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl or alkoxy group, an amino group, a cyano group, a nitro group or a carboxyl group; R_{17} and R_{18} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; and X is an anion typified by SbF_6^{-} , ClO_4^{-} , NO_3^{-} or a halogen ion).

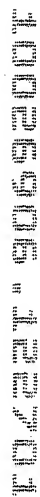
9. (Amended) A near infrared absorption material according to Claim 1 [~~or 2~~], wherein the transparent substrate is made from a polycarbonate, a polyarylate or both of them.

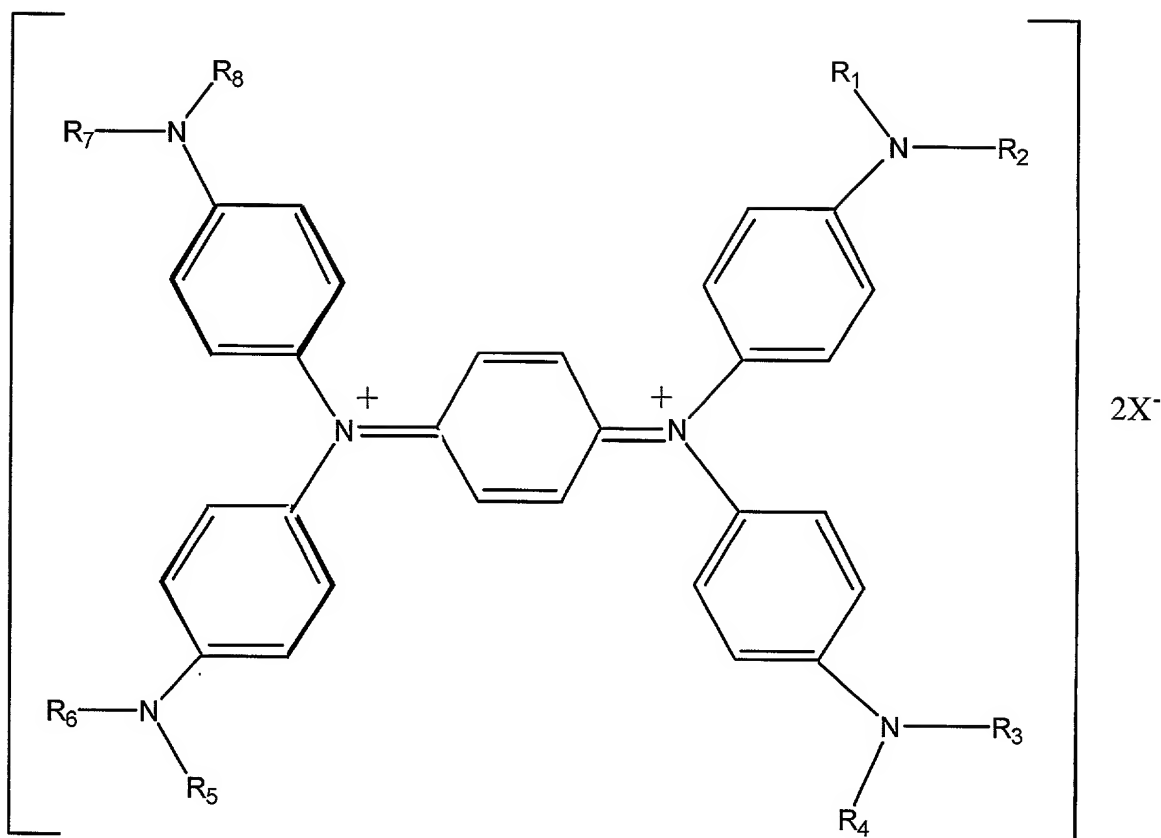
10. (Amended) A near infrared absorption material according to Claim 1 [~~or 2~~], wherein the transparent substrate is made from at least one kind selected from a polyethylene terephthalate, a polyethylene naphthalate and a polycycloolefin.

11. (Amended) A filter for plasma display panel, made from a near infrared absorption material set forth in [~~any of Claims 1 to 10~~] Claim 1.

New claims 12 to 27 have been added as follows:

12. (New) A near infrared absorption material according to Claim 2, wherein the near infrared absorption dye is a dithiol-nickel complex represented by the following formula (1):

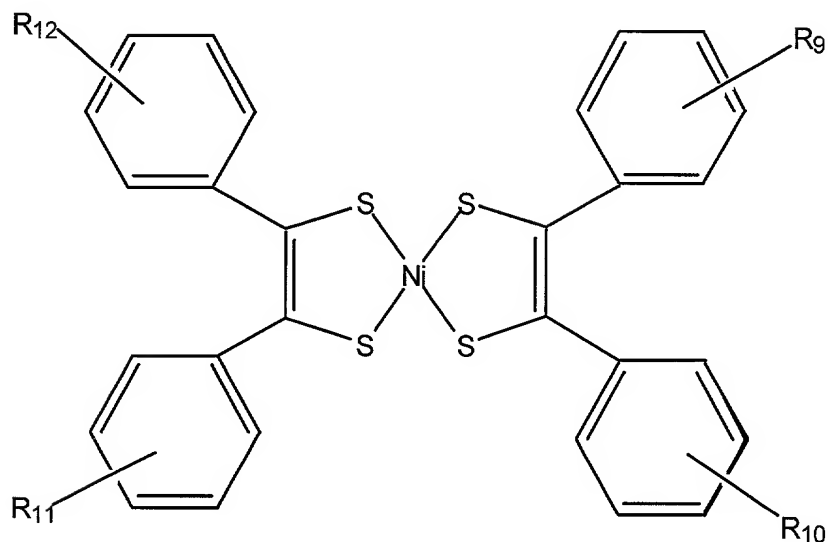
[illegible]



(wherein R_1 to R_8 may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group or a C_{6-12} aryl group; and X is an anion typified by SbF_6^- , ClO_4^- , NO_3^- or a halogen ion).

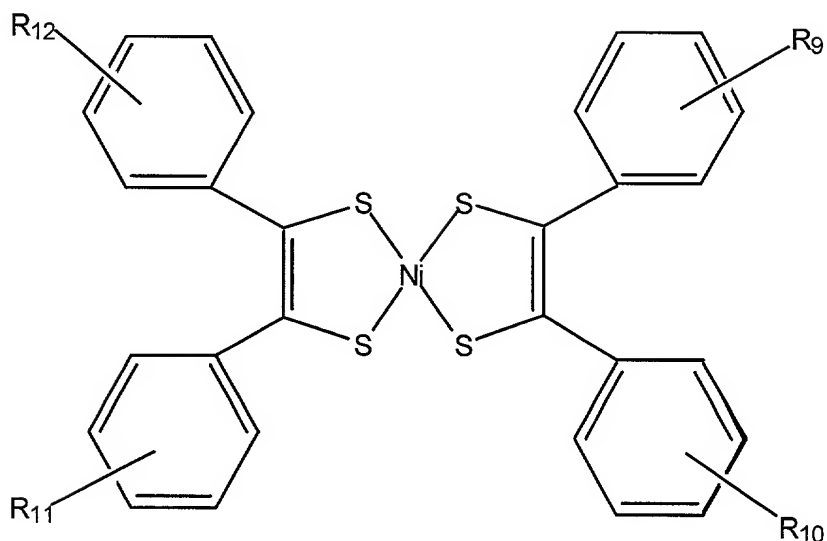
13. (New) A near infrared absorption material according to Claim 2, which further contains at least one kind of dithiol-

nickel complex represented by the following general formula (3):



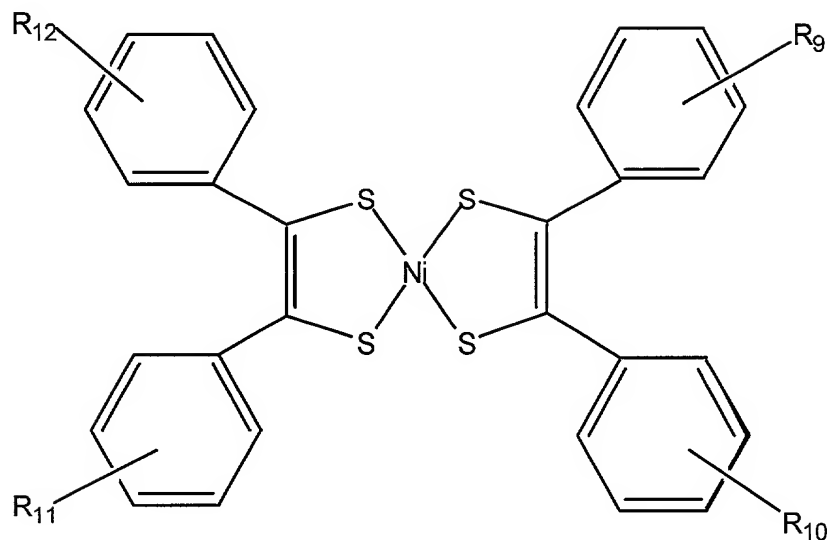
(wherein R₉ to R₁₂ may be the same or different and are each a hydrogen atom, a C₁₋₄ alkylene group, an aryl group, an aralkyl group, an alkylamino group, an alkoxy group or a halogen atom).

14. (New) A near infrared absorption material according to Claim 3, which further contains at least one kind of dithiol-nickel complex represented by the following general formula (3):



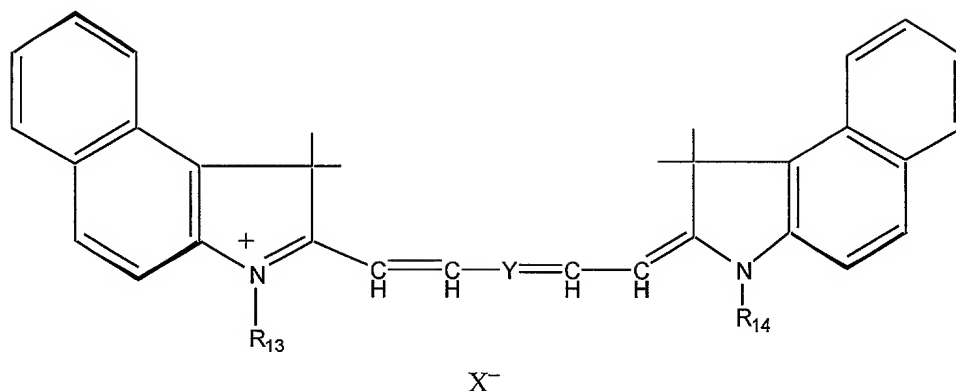
(wherein R₉ to R₁₂ may be the same or different and are each a hydrogen atom, a C₁₋₄ alkylene group, an aryl group, an aralkyl group, an alkylamino group, an alkoxy group or a halogen atom).

15. (New) A near infrared absorption material according to Claim 12, which further contains at least one kind of dithiol-nickel complex represented by the following general formula (3):



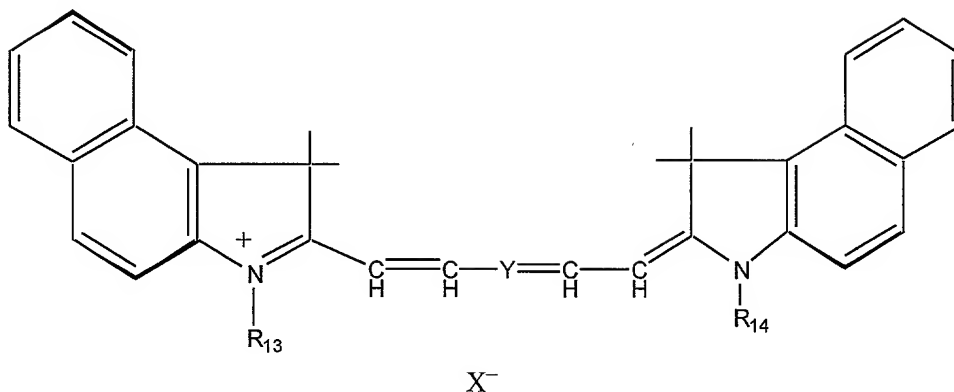
(wherein R₉ to R₁₂ may be the same or different and are each a hydrogen atom, a C₁₋₄ alkylene group, an aryl group, an aralkyl group, an alkylamino group, an alkoxy group or a halogen atom).

16. **(New)** A near infrared absorption material according to Claim 2, which further contains at least one kind of polymethine dye represented by the following general formula (4):



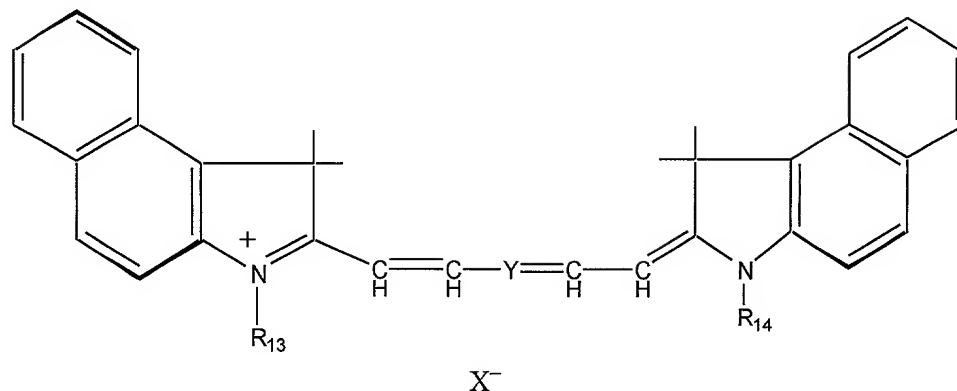
(wherein R_{13} and R_{14} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; Y is a sulfur atom, a methine group or a chlorocyclohexene group; and X is an anion typified by SbF_6^{-} , ClO_4^{-} , NO_3^{-} or a halogen ion).

17. (New) A near infrared absorption material according to Claim 3, which further contains at least one kind of polymethine dye represented by the following general formula (4):



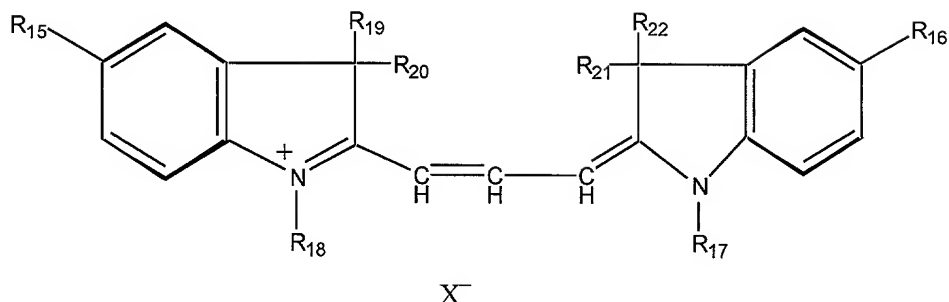
(wherein R_{13} and R_{14} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; Y is a sulfur atom, a methine group or a chlorocyclohexene group; and X is an anion typified by SbF_6^{-} , ClO_4^{-} , NO_3^{-} or a halogen ion).

18. (New) A near infrared absorption material according to Claim 12, which further contains at least one kind of polymethine dye represented by the following general formula (4):



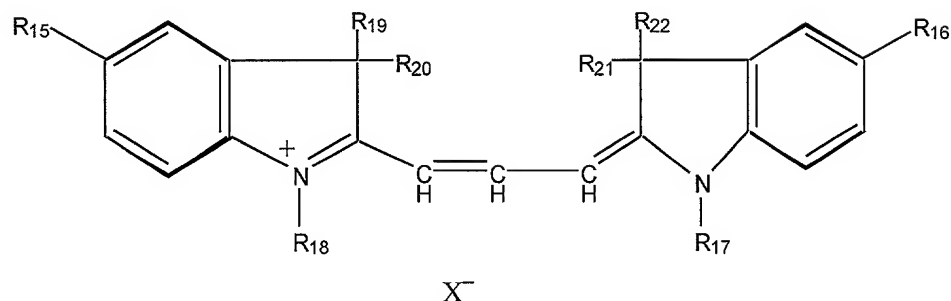
(wherein R_{13} and R_{14} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; Y is a sulfur atom, a methine group or a chlorocyclohexene group; and X is an anion typified by SbF_6^- , ClO_4^- , NO_3^- or a halogen ion).

19. (New) A near infrared absorption material according to Claim 2, wherein the dye selectively absorbing a light of 550 to 620 nm wavelength region is at least one kind of cyanin dye represented by the following general formula (6):



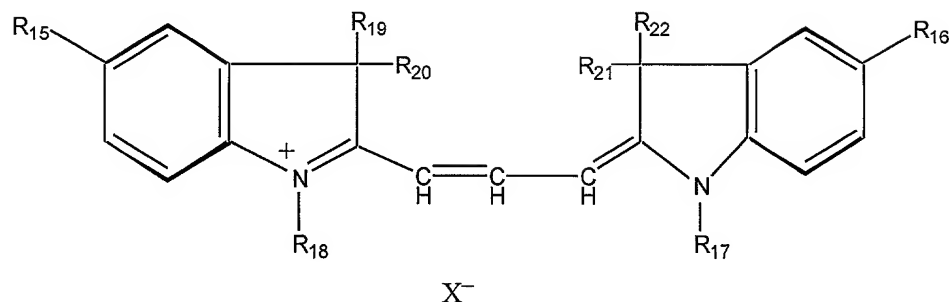
(wherein R_{15} , R_{16} , R_{19} , R_{20} , R_{21} and R_{22} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl or alkoxy group, an amino group, a cyano group, a nitro group or a carboxyl group; R_{17} and R_{18} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; and X is an anion typified by SbF_6^- , ClO_4^- , NO_3^- or a halogen ion).

20. (New) A near infrared absorption material according to Claim 3, wherein the dye selectively absorbing a light of 550 to 620 nm wavelength region is at least one kind of cyanin dye represented by the following general formula (6):



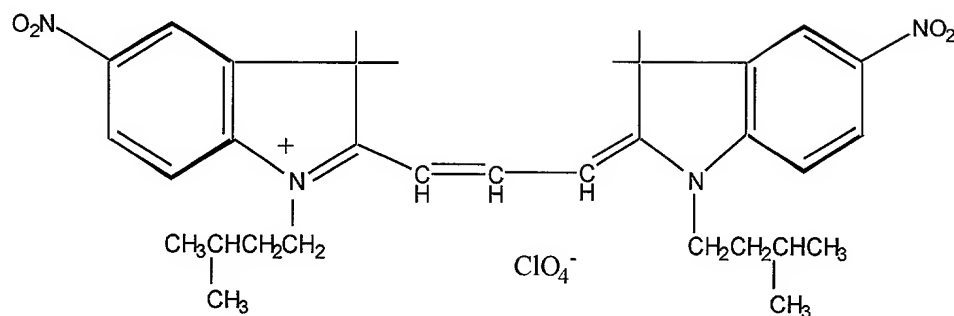
(wherein R_{15} , R_{16} , R_{19} , R_{20} , R_{21} and R_{22} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl or alkoxy group, an amino group, a cyano group, a nitro group or a carboxyl group; R_{17} and R_{18} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; and X is an anion typified by SbF_6^- , ClO_4^- , NO_3^- or a halogen ion).

21. (New) A near infrared absorption material according to Claim 12, wherein the dye selectively absorbing a light of 550 to 620 nm wavelength region is at least one kind of cyanin dye represented by the following general formula (6):

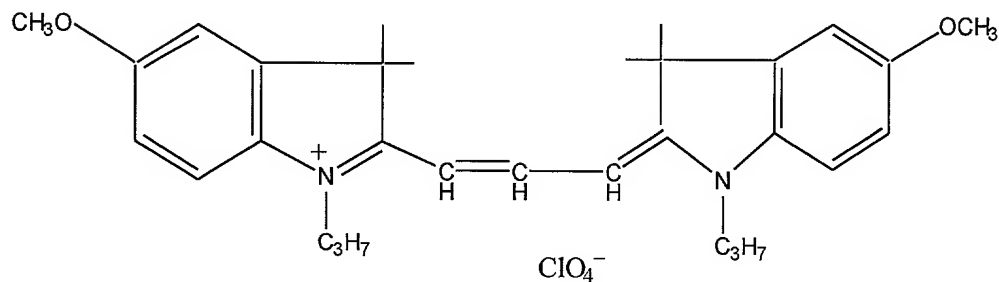


(wherein R_{15} , R_{16} , R_{19} , R_{20} , R_{21} and R_{22} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl or alkoxy group, an amino group, a cyano group, a nitro group or a carboxyl group; R_{17} and R_{18} may be the same or different and are each a hydrogen atom, a C_{1-12} alkyl group, a C_{6-12} aryl group, an alkenyl group, an aralkyl group or an alkynyl group; and X is an anion typified by SbF_6^{-} , ClO_4^{-} , NO_3^{-} or a halogen ion).

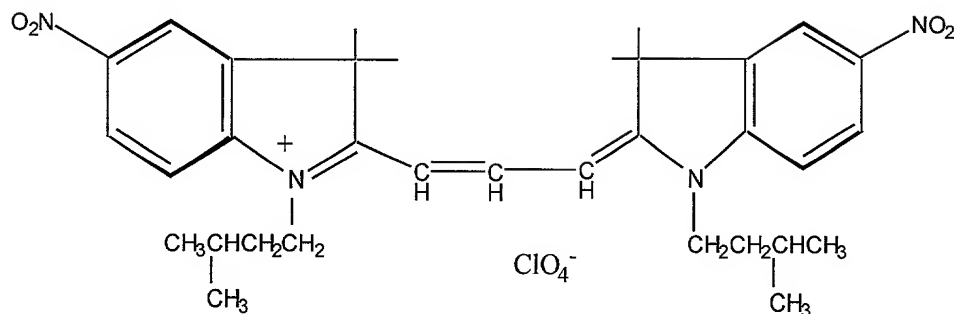
22. (New) A near infrared absorption material according to Claim 19, wherein the dye selectively absorbing a light of 550 to 620 nm wavelength region is at least one dye selected from the dyes represented by the following general formula (7):



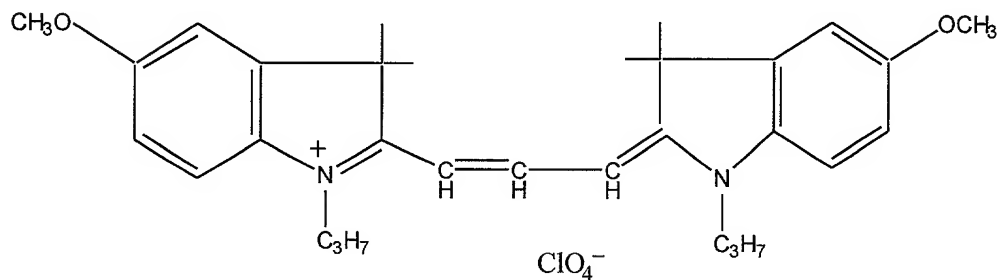
and the dyes represented by the following general formula (8):



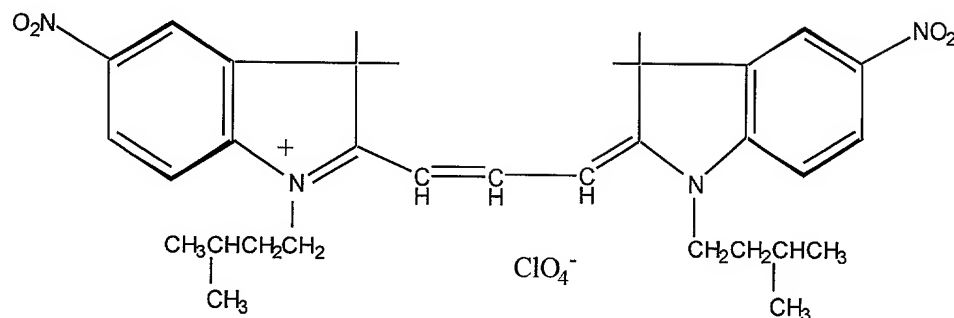
23. (New) A near infrared absorption material according to Claim 20, wherein the dye selectively absorbing a light of 550 to 620 nm wavelength region is at least one dye selected from the dyes represented by the following general formula (7):



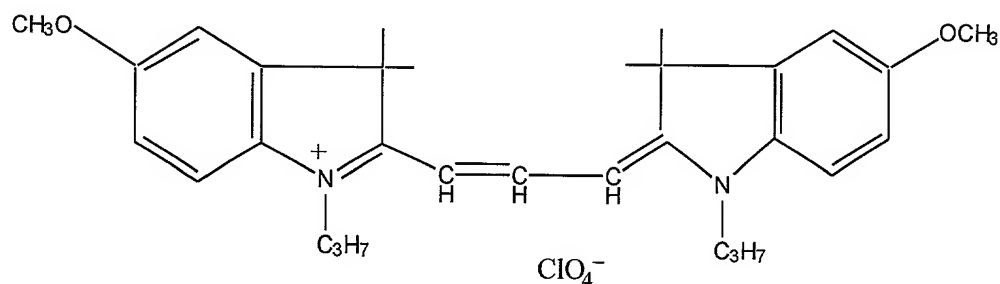
and the dyes represented by the following general formula (8):



24. (New) A near infrared absorption material according to Claim 21, wherein the dye selectively absorbing a light of 550 to 620 nm wavelength region is at least one dye selected from the dyes represented by the following general formula (7):



and the dyes represented by the following general formula (8):



25. (New) A near infrared absorption material according to Claim 2, wherein the transparent substrate is made from a polycarbonate, a polyarylate or both of them.

26. (New) A near infrared absorption material according to Claim 2, wherein the transparent substrate is made from at least one kind selected from a polyethylene terephthalate, a polyethylene naphthalate and a polycycloolefin.

27. (New) A filter for plasma display panel, made from a near infrared absorption material set forth in Claim 2.

FOCUS - 1994